






MYP MATHEMATICS


INDICES & SURDS


Laws of Indices:



$$x^0 = 1 \text{ (where } x \neq 0\text{)}$$



$$x^1 = x$$


$$x^a \times x^b = x^{a+b}$$



$$x^a \div x^b = x^{a-b}$$



$$(xy)^n = x^n \times y^n$$


$$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$$


$$(x^m)^n = x^{m \times n}$$

Reciprocals:


$$x^{-m} = \frac{1}{x^m}$$


$$ax^{-m} = \frac{a}{x^m}$$

Difference of two squares:


$$x^2 - y^2 = (x - y)(x + y)$$


Binomials:


$$(x + y)^2 = (x + y)(x + y) = x^2 + 2xy + y^2$$

$$(x - y)^2 = (x - y)(x - y) = x^2 - 2xy + y^2$$


Surds as fractional powers:



$$\sqrt{x} = x^{1/2}$$



$$\sqrt[3]{x} = x^{1/3}$$


$$\sqrt[n]{x^m} = x^{m/n}$$

Manipulating surds:


$$\sqrt{ab} = \sqrt{a} \times \sqrt{b}$$


$$\sqrt{\left(\frac{a}{b}\right)} = \frac{\sqrt{a}}{\sqrt{b}}$$


$$\sqrt{a} \times \sqrt{a} = a$$

Rationalising denominators:

- Fractions in the form of $\frac{1}{\sqrt{a}}$, multiply the top and bottom by \sqrt{a} .
- Fractions in the form of $\frac{1}{a+\sqrt{b}}$, multiply the top and bottom by $a - \sqrt{b}$.
- Fractions in the form of $\frac{1}{a-\sqrt{b}}$, multiply the top and bottom by $a + \sqrt{b}$.